Polynomial Operations PRACTICE (version 40)

1. Let polynomials $p(x)$ and $q(x)$ be defined below.

$$p(x) = -2x^5 + 10x^4 + 8x^3 - 5x^2 - 7$$

$$q(x) = 8x^5 + 7x^4 + 5x^3 - 10x - 2$$

Express the sum of $p(x) + q(x)$ in standard form.

2. Let polynomials $a(x)$ and $b(x)$ be defined below.

$$a(x) = -7x^2 + 6x - 8$$

$$b(x) = -8x - 4$$

Express the product $a(x) \cdot b(x)$ in standard form.

3. Express $(x + 1)^5$ in standard (expanded) form.

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4. Let polynomials $f(x)$ and $g(x)$ be defined below.

$$f(x) = x^3 + 12x^2 + 26x - 1$$
$$g(x) = x + 9$$

The quotient of $\frac{f(x)}{g(x)}$ can be expressed as a polynomial, $h(x)$, and a remainder, R (a real number).

$$\frac{f(x)}{g(x)} = h(x) + \frac{R}{x+9}$$

By using synthetic division or long division, express $h(x)$ in standard form, and find the remainder R.

5. Let polynomial $f(x)$ still be defined as $f(x) = x^3 + 12x^2 + 26x - 1$. Evaluate $f(-9)$.